Original Article

Analysis of serum potassium levels in AMI patients

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ABSTRACT:

Aim: To assess serum potassium levels in Acute myocardial infarction patients. **Materials & methods:** 100 confirmed cases of AMI were included in the present study. 100 age and gender-matched healthy subjects were taken as control. Collection of venous blood samples was done in the study group on the day of admission within 12 hours from anticubital vein with all aseptic precautions in plain and vacutainers for the purpose of routine baseline blood investigations. For serum potassium levels, blood was allowed to clot at room temperature for half an hour and then centrifuged at 3000 rpm for five minutes. **Results:** Mean serum potassium levels among the patients of the study group and control group were 3.94 mEq/L and 4.82 mEq/L respectively. While comparing statistically, significant results were obtained. Out 100 patients of the AMI group, hypokalaemia was seen in 35 percent of the patients. **Conclusion:** Potassium levels should be monitored regularly in AMI patients.

Key words: Acute myocardial infarction, Potassium

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INTRODUCTION

Ischaemic heart disease remains the commonest cause of deaths. Among its various manifestations, acute myocardial infarction continues to present a particular challenge to emergency health services. Myocardial infarction, when diagnosed, is now classified into five types. Detection of a rise and a fall of troponin are essential to the diagnosis of acute MI. However, high sensitivity troponin assays can increase the sensitivity but decrease the specificity of MI diagnosis. The ECG remains a cornerstone in the diagnosis of MI and should be frequently repeated, especially if the initial ECG is not diagnostic of MI.[1-3] There have been significant advances in adjunctive pharmacotherapy, procedural techniques and stent technology in the treatment of patients with MIs. The routine use of antiplatelet agents such as clopidogrel, prasugrel or ticagrelor, in addition to aspirin, reduces patient morbidity and mortality. Percutaneous coronary intervention (PCI) in a timely manner is the primary treatment of patients with acute ST segment elevation MI. Drug eluting coronary stents are safe and beneficial with primary coronary intervention.[4-6] Hence; on the basis of above-mentioned data, the present study was undertaken for evaluating serum potassium levels in acute myocardial infarction patients.

MATERIALS & METHODS

The present study was conducted with the aim of analysing the serum potassium levels in AMI patients. 100 confirmed cases of AMI were included in the present study. 100 age and gender-matched healthy subjects were taken as control. Collection of venous blood samples was done in the study group on the day of admission within 12 hours from anticubital vein with all aseptic precautions in plain and vacutainers for the purpose of routine baseline blood investigations. For serum potassium levels, blood was allowed to clot at room temperature for half an hour and then centrifuged at 3000 rpm for five minutes. All the results were recorded and analysed using SPSS Software. Student t test was used for evaluation of level of significance.

RESULTS

Mean age of the subjects of the study group and control group was 46.5 years and 45.9 years respectively. Majority proportion of subjects of both the study groups were males. Mean serum potassium levels among the patients of the study group and control group were 3.94 mEq/L and 4.82 mEq/L respectively. While comparing statistically, significant results were obtained. Out 100 patients of the AMI group, hypokalaemia was seen in 35 percent of the patients.

Table 1: Potassium levels

Potassium levels	Study group	Control group
Mena	3.94 mEq/L	4.82 mEq/L
SD	1.2	1.5
p- value	0.000 (Significant)	

DISCUSSION

Acute myocardial infarction (AMI) is a major cause of morbidity and mortality worldwide. The burden of

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AMI can be substantial if the individual is relatively young as they are commonly breadwinners of the family and in the prime of their working life with significant contributions to the society. Several studies have described the clinical profiles and outcomes of young adults with AMI and its incidence ranged between 2% and 10%. In general, young patients are more likely to be male, have a history of smoking and hyperlipidemia but less likely to have other co-morbidities and demonstrate less extensive coronary artery disease (CAD) on coronary angiogram.[6-9] Hence; on the basis of above-mentioned data, the present study was undertaken for evaluating serum potassium levels in acute myocardial infarction patients.

Mean serum potassium levels among the patients of the study group and control group were 3.94 mEq/L and 4.82 mEq/L respectively. While comparing statistically, significant results were obtained. Out 100 patients of the AMI group, hypokalaemia was seen in 35 percent of the patients Goyal A et al determined the relationship between serum potassium levels and in-hospital mortality in AMI patients in the era of β-blocker and reperfusion therapy. Retrospective cohort study using the Cerner Health Facts database, which included 38,689 patients with biomarker-confirmed AMI, admitted to 67 US hospitals between January 1, 2000, and December 31, 2008. All patients had in-hospital serum potassium measurements and were categorized by mean postadmission serum potassium level (<3.0, 3.0-<3.5, 3.5-<4.0, 4.0-<4.5, 4.5-<5.0, 5.0-<5.5, and ≥5.5 mEq/L). Hierarchical logistic regression was used to determine the association between potassium levels and outcomes after adjusting for patient- and hospital-level factors. There was a U-shaped relationship between mean postadmission serum potassium level and in-hospital mortality that persisted after multivariable adjustment. Compared with the reference group of 3.5 to less than 4.0 mEq/L (mortality rate, 4.8%; 95% CI, 4.4%-5.2%), mortality was comparable for mean postadmission potassium of 4.0 to less than 4.5 mEq/L (5.0%; 95% CI, 4.7%-5.3%), multivariable-adjusted odds ratio (OR), 1.19 (95% CI, 1.04-1.36). Mortality was twice as great for potassium of 4.5 to less than 5.0 mEq/L (10.0%; 95% CI, 9.1%-10.9%; multivariable-adjusted OR, 1.99; 95% CI, 1.68-2.36), and even greater for higher potassium strata. Similarly, mortality rates were higher for potassium levels of less than 3.5 mEq/L. In contrast, rates of ventricular fibrillation or cardiac arrest were higher only among patients with potassium levels of less than 3.0 mEq/L and at levels of 5.0 mEq/L or greater.[10]

Choi JS et al retrospectively studied 1,924 patients diagnosed with AMI. The average serum potassium levels measured throughout the hospitalization were obtained and statistically analyzed. Patients were categorized into 5 groups to determine the relation between mean serum potassium and long-term mortality: <3.5, 3.5 to <4.0, 4.0 to <4.5, 4.5 to <5.0, and ≥5 mEq/L. The long-term mortality was lowest in the group of patients with potassium levels of 3.5 to <4.0 mEq/L, whereas mortality was higher in the patients with potassium levels≥4.5 or <3.5 mEq/L. In a multivariate Cox-proportional regression analysis, the mortality risk was greater for serum potassium levels of >4.5 mEq/L (hazard ratio [HR] 1.71, 95% confidence interval [CI] 1.04 to 2.81 and HR 4.78, 95% CI 2.14 to 10.69, for patients with potassium levels of 4.5 to <5.0 mEq/L and ≥5.0, respectively) compared with patients with potassium levels of 3.5 to <4.0 mEq/L. The mortality risk was also higher for patients with potassium levels<3.5 mEq/L (HR 1.55, 95% CI 0.94 to 2.56). In contrast to the association with long-term mortality, there was no relation between serum potassium levels and the occurrence of ventricular arrhythmias. The results of their analysis suggest that there is a need for change in our current concepts of the ideal serum potassium levels in patients with AMI.[11]

CONCLUSION
Potassium levels should be monitored regularly in AMI patients.

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